

docks and marinas, indirect damage to SAV can result from boating activity associated with these structures. Shoals and other shallow bottoms supporting SAV may become scarred as boating activity to and from the docking areas increases. Boat wakes can destabilize and erode SAV beds, or resuspend sediment, reducing light penetration. As additional docks and marinas are constructed along the coast, the potential for boating-related damage increases.

In other areas of the United States, there are stringent standards for dock construction to minimize impacts to SAV, including dock height above the water, minimum water depth, and maximum square footage. In North Carolina, the depth of water at the dock end is not considered in the Coastal Resource Commission (CRC) rules. To minimize shading effects to wetland plants, CRC rules require a dock height of at least three feet (0.91 m) above the wetland substrate, and a pier width of no greater than six feet (1.83 m) [CRC rule 15A NCAC 07H.0208 (6)]. However, there is no requirement for height above the water surface. Results from Connell and Murphey (2004) indicate that current dock designs over SAV beds in North Carolina result in a reduction in SAV coverage and density. Dock criteria should be evaluated by CRC to determine if existing requirements are adequate for SAV survival and growth and what changes would be needed to allow adequate light beneath docks. The permit requirements for docks and piers may need to be changed accordingly.

Bottom disturbing fishing gears have the potential to destroy or damage SAV (DMF 1999). Also, the Fisheries Moratorium Steering Committee's Habitat Subcommittee identified specific habitat impacts from various commercial and recreational fishing gears used in North Carolina waters, and made recommendations to minimize such impacts (MSC 1996). The Fisheries Moratorium Steering Committee presented the summary of findings to the Joint Legislative Commission on Seafood and Aquaculture of the General Assembly.

Damage from fishing gears vary in severity. Hand gear, such as bull rakes and large oyster tongs, can uproot SAV and cause substantial damage, but generally to smaller areas than mechanical gears (Thayer et al. 1984). Current MFC rules prohibit use of rakes more than twelve inches wide or weighing more than six pounds in SAV [MFC rule 15A NCAC 03K.0304 (a) (2)]. Use of smaller hand rakes is allowed.

Mobile gear, such as long haul seines or bottom trawls, can shear or cut the blades of SAV, or uproot plants without major disruption of the sediment (ASMFC 2000). Shearing of above-ground plant biomass does not necessarily result in mortality of SAV, but shoot density is reduced, decreasing productivity since energy is diverted to replace the damaged plant tissue. In addition, the nursery and refuge functions are reduced in the absence or reduction of structure rather than new growth. Trawl doors can dig into the sediment up to one foot deep depending on gear configuration, vessel speed and other factors. Other fishing practices can cause severe disruption of the sediment and damage the roots of SAV. Gears that disturb the sediment and below-ground plant structures, like toothed dredges, heavy trawls, and boat propellers, may cause total loss of SAV in the affected area, requiring an extended time period to recover (ASMFC 2000). SAV can